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Ad eundem of S. Ca.
Inaugural Essay
on

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Vermes Intestinorum

In the Degree of Doctor of Medicine

By Francis Johnson

of Charleston
S. C.

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It attempt a classification, or arrangement of all worms, ever met with, in the body of man, and to repeat the accounts and observations of all who have ever written upon this subject: would be a work as unprofitable to the reader, as tedious to the writer; and when we consider thivs irregularity as to place in this or that organ, the inability of such niceies will be evident, since after all their history as regards primative existence, serves more to interest the curiosity of a Naturalist than advance the knowledge of the Physician. Our principal object in the study of diseases being the application of its results for their mitigation or removal; it follows that the value of all knowledge should be commensurate with its utility, hence that knowledge, whence no beneficial effects are derived, be the attainments of it, over so labourous may be considered as comparatively useless.

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For the attainment of this end, and establishment
of this point, I shall confine myself to the
consideration of those worms only, whose presence
injurious and deleterious effects upon the human frame
form the subjects of most frequent consideration
in the treatment of Worm disorders
their reduction into three general classes comprising
"Trichia, Lumbricoides & Ascarides.

The question, as to the origin of worms
in the bodies of animals, and more especially
in Man, when stripped of the many, various
and futile hypotheses of Naturalists, and
treated with that evidence, which alone should
be relied on, as valuable: viz, the evidence
of facts, becomes one, of satisfaction, at least,
of note of importance, to the physician.

When Medicine was yet in its earliest state
nothing more was thought necessary for the
generation of Worms, than the mere decay
of matter: the ingenuity of Metaphysical

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meanings, was a force sufficient for the estab-
lishment of the stupid Theory: that matter
rarely combined, was by a certain order of
nature, possessed of an innate property of
making and creating living beings.

But when the studies of Men, whose eager researches after knowledge, proved these animals
to be regularly endowed with organs, shamed
the difference of structure as regards sexes,
that some were viviparous, some oviparous
and casting away with, the pre-existing opinion
of a founding principle in inanimate matter
established that of sexual generation, the
subject then received the degree of attention
it merited. It was Aristotle who first taught
that worms found in the intestines, were there
generated from accrementitious matter.

Hippocrates: that they were first developed
in the Fetus from the meconium: observing by
way of argument, that as the meconium remains

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at longer in the intestines, than did the faces
or was it, more likely to be the preexisting cause
thus differing from the former only as regarded
the means. Buffon's theory of generation, which
varied but little, and that little unessential
supposes them developed by matter not inest
but living and disposed to the generation of
these animalculæ, but effects have, and must
have causes adequate to their production,
organised beings must spring from living
organised sources, Microscopical observations
have long since satisfactorily demonstrated
these animalculæ as possessing the organs of
generation perfect and complete, their ova have
been seen; and it now remains to consider how
these ova enter the system, and after entrance
how fecundated & developed & and brought into
life. Microscopical observations can at all times
detect millions of animalculæ floating in the
atmosphere and in fluids, of bulk so dimin-
utive, that according to the experiments of a

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fill a sphere, whose diameter is a hair, these
imperspectably entering, the system are by means
of the circulating fluids, transported through
out and deposited variously in different parts
of the body where meeting with a state of things
favourable to their developments; are gradu-
ally matured. They may be admitted along
with the food, as is the account in the Latin
journal of a King replete with Ascarides, so
much so that persons using such water become
affected with these Worms to a most afflic-
ting extent, one species of *Tarvia* is found in
the waters of Siberia, the inhabitants of
Sinochskie are peculiarly liable to Ascarides
the Hollanders not less so to *Tarvia*, both
as in beds - to the use of such waters, is
an unanticipated fact that children are
most obnoxious to worms during fruit
seasons, occasioned doubtless by the nutriment
or sea of such worms being admitted into the

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eliminating canal along with the use of such fruits the question may be fairly asked why do not such effects appear in the adult state, and as fairly answered by the known facts, that Mucus which forms the *perineuridus* in all cases of worms, is in much greater quantities eliminated in the intestines of children of than in adults.

They may enter along with the saliva, as is the case with the ova of the varieties of the genus of *Ascaris*, *Brood*, or *Gad Fly*, the development of which ova cause the disease in horses known by the name of *Boils*, and in sheep by the name of *Stagger*. They may enter immediately into the circulation by conveyance onto the minute cells of the lungs, in the act of inspiration, or they may by means of absorption, the ova of the *Ascaris* *Loeis* is most probably an instance of this, on all of the above mentioned cases there occurs

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necessary for their production a particular state of the system adapted to their presence since when removed from the body, they die this circumstance has been unfairly made use of as argument against their external production, but it must be born in mind that Mucus their medium is to the worm what water is to the fish, or atmospheric air to the clasp of warm blooded animals independant of this, when removed from the body, is in most cases by the violent action of Anthelmintic Medicines, which in most instances destroy as well as evacuate The signs general and common to the presence of worms are exceedingly obscure and unsatisfactory, hence the necessity for close attention to all the minutiae of symptoms, as we sometimes meet with diseases terminating by the expulsion of one or more worms, whose presence was never for a moment suspected.

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for instance, a patient complains of severe pain in the head, vertigo, temporary blindness &c the physician treats the case as one of a nervous disorder without any benefit resulting from such treatment; four Lumbrici were eventually discharged, the nature of the case then understood, proper treatment resorted to, and the evacuation of others entirely removed the disease, such accounts as this continually occurring sufficiently point out the need of for close attention.

Although the most certain, and valuable sign of the presence of worms, be their actual expulsion by the mouth or anus, still there exist some which when taken collectively, will in most instances enable the Physician to distinguish the peculiarity of the disease.

The appetite is variable, sometimes moderate again a total aversion for any thing like food, an imperfect digestion or mescolabia, coincid by the fetid breath

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and acid eructations, there are severe griping pains, in the Umbilical region especially, most severe when the Stomach is empty very often ceasing upon food being taken the stools are at times thin and watery indicating a species of Diarrhoea, at other times there will be present the reverse of these an obstinate constipation, accompanied by more or less Torment and Tenesmus, there is grinding of the teeth in sleep, sticking of the nostrils, with adema of the upper lip: countenance now pale, now flushed, pains in the head frequent, and at times so severe as to amount to Delirium, the eyes are dull and fixed steadily upon surrounding objects the pupils perceptibly dilated, the breathing is performed laboriously, with palpitations of the heart. to these may be added a peculiar slow irregular intermittent fever, the *Febus Verminosa* of authors, the eructations attended with diarrhoea, the semipus with

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morbid vigilance, though whether proceed-
ing from the irritating presence of worms
or only the undue accumulations in the
digestive organs, a matter of some doubt.
in fine, in all cases of diminished strength
and emaciation however induced combined
with a debilitated state of the bowels, we
may in children safely suspect the presence
of worms to be the cause.

Productive of the most mischievous conse-
quences upon the constitution is the *Tanica*, charac-
terised by flat jointed bodies, of which there
exist two varieties *Tanica Setae* and *Tanica*
Lata or *Tanica Vulgaris*. *Tanica Lata* is that
variety characterised by short broad joints
increasing in length towards the middle and
tapering off, gradually at the extremity.
the head of this variety is discoverable only
with the aid of the Microscope. it form
is oval, resembling a small tubule.

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the tail terminates forkings into two processes
the one longer than the other, from its internal
structure is ranked among the class "Nipharous"
when examined with the Microscope, in each
joint is seen an Ovarium resembling a small
tuberculated process, in which the ova are
discoverable in great numbers. *Tenia* is most
commonly in the small intestines, where it feeds
upon the chyle, its motion is spiral, which fact
from an optical delusion may in a measure
explain the many improbable tales told of its
great length. One specimen of *Tenia* as preserved
in the university of Pavia is said to be in length
231 feet, being nearly seven times that of the
whole alimentary canal, an other of 114 feet is
recorded in the medical collections in Copenhagen
if the correctness of these two cases there can be no
doubt. *Tenia Solium* is also found inhabiting
the small intestines, and there feeding upon
the animalised juices, it consists of portions
communicated, the joints whereof are flat, broad

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and longer than the *Tonina lata*, generally of a white colour, though at times coloured from the juices contained being of that cast, on the margins or alternate angles of the contiguous joints, are seen projecting points, with a force or depression the head in this variety approaches in shape, nearest to the form of the square, the mouth in a manner projecting forwards, with three rows of hooks behind, situated when the flat surfaces are seen four round projecting apertures, acting as suckers, the tail is formed by an evagination of the last joint when discharged by pieces, the joints of the worm resemble in appearance the common found seeds, whence the name *Acurbitanus* given it by Hebeton each joint composed of the lower of self union a circumstance much to be doubted. The symptoms peculiar to the presence of *Tonina* are an inordinate desire for food, a painful sensation of cold in the stomach, the move

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ments of a living body in this viscous, have been
affirmed to have been felt accompanied by
nausea and disposition to vomit.

Lumbricidae

This class was by Linnaeus supposed to be the same
with the Lumbricus Terrestris or common earth
worm, structural examinations have however
entirely removed the mistaken idea of their
Identity. The extremities of the Lumbricus
are more rounded. the anus of the common
Earth-worm opens at the very extremity
of the tail. the mouth is a small fovea
on the under surface of the head, whereas
in the Lumbricus the anus is on the under
surface of the tail, the mouth singularly
formed: three small projecting points are
seen coming from the head, in between these
lies the mouth the Earth-worm has a
Membrane folded over the head, this pecu
liarity is not met with in the Lumbricus

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As regards internal structure a still greater difference is to be found: The alimentary canal of one is a plain straight tube leading from the head to the tail, in the other we find a complete stomach, with other peculiarities, the parts of generation in the Intestinal worm are distinctly male or female whereas in the Earth worm the sexes are combined, the animal being a Hermaphrodite. in length the body of the intestinal worm varies from four to twelve inches in length in thickness from two to four lines, sometimes they are found alone though usually in great numbers for the most part infesting the intestines of children and sickly adults from the peculiar structure of the head is capable of insinuating itself into the mucus membrane of the intestines, causing at times the most excruciating pain.

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"Ascaris" have by some naturalists been incor-
rectly clasped along with the Lumbricidae as
a variety only, but very essential differences
may be seen, as regards length, thickness and
internal structure. The Ascaris is a small
round worm inhabiting for the most part
the rectum, though sometimes met with in the
stomach, oesophagus and vagina: not exceed-
ing an inch in length, very slender with
a quick lively motion whence its name.
Its continual motion no doubt is the cause
of occasional violent and irritating effects
upon the Constitution particularly in the anus.
Notwithstanding the light view in which
the presence of worms is by some practitioners
regarded, considering them as perfectly harm-
less, or even beneficial as acting the part
of scavengers, or as a persecuted race
more stoned against, than running, the
majority of medical men at least are

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aware of the many complicated and obscure diseases, that are at times brought on, by the mutating presence through the chain of sympathetic connexions. In children, and in persons in whose histories from debility, there is always present more mucus than in robust individuals, Ascarides are oftenest met with mucus forming a mucus for the deposit of their ova, then full development and propagation. Ascarides situated in the rectum are often productive of Ileus, and hemorrhage, gnawing of the teeth, itching of the nostrils, and other sympathetic affections, probably caused by irritation upon the Inferior Mesenteric plexus.

The inadmissible employment of drastic purgatives and emetics for the evacuation of worms, is from its debilitating effects highly injurious, in as much as the employment of such remedies tend directly to increase

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the heretofore existing debility, and consequently the predisposition for nematocidal affections, yet at times there use become absolutely necessary, other medicines may kill, and disengage from their hold, but it will require the use of drastic purgatives to promote their entire discharge and removal. In the treatment of worms and those constitutional derangements depending upon their presence, much regard should be paid to the suspected quantity as well as species of the worm since from a difference in the organization in the animal existence has taught, that they do not all equally yield to the influence of the same remedies: medicines which in most instances easily expel Ascarides, may fail to produce similar effects upon Taenia or Lumbriocides.

A history of each of the numerous class of

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Anthelmintics, which have at various times been collected from the vegetable as well as the mineral kingdom, would of itself fill a volume when we consider that scarce an article of *Materialia Medicinae* exists, without some vermifuge properties having under certain circumstances been exhibited; I shall therefore notice as briefly as possible, the mode of treatment peculiar to be observed, in each of the above-mentioned classes. The treatment for *Oscariades* is for the most part simple, from their situation in the rectum, the irritant thus excited may in most instances relieve by enemas of salt and water or of castor oil, decoction of worm wood or a fomentation followed by the sufficient combination of Alcalic purgatives. Tobacco smoke has been successfully employed in form of Gleytes, though severely censured by Hobson.

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as productive of more injury than benefit. The treatment for the expulsion of *Lumbricoides* does not always succeed so satisfactorily. Of the vegetable anthelmintics none appears to have so general a influence as the *Spigelia Marilandica* or Pink root. Given either in form of powder or as a decoction of the former the usual dose is from five to thirty grains of the latter two drachms to an ounce, according to the exigencies of the case, the age or strength of the patient. Whether the astringent properties of this medicine depend upon its purgative or narcotic properties or both, has not yet been determined upon, but as its cathartic effects do not always manifest themselves, its use is usually followed by the Sub Muri ^{Hydro} ^{ggi} in combination with Jalap, Rhen-bart, Gamboge, Scammony or Colocynth, all which medicines have separately more or less, the

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properties of anthelmintics from their drastic qualities. Camphor has been highly recommended by Briva, as quickly destroying them from their mucus, as well as calming the spasmodic convulsions brought on by their irritation. Its efficacy here is probably owing to the humid aromatic fumes belonging to this medicina. Ipecac. resist the power of medicine more obstinately, and are in their effects upon the constitution more terrible than all the preceding drapes, from their great length to almost impossible to void them entire, in most instances passing away infants. The drastic purgatives are all more or less efficacious in the expulsion of Ipecac. Gamboge in large doses forms the essential ingredient in all the favourite nostrums of the day, and is amongst the most active. Many wonderful cures are on record as performed by the Male Fern "Polypodium" *Feliz-Nas*, the oldest anthelmintic, we are

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acquainted with The Male Stern has been in use since the days of Galen. its efficacy was doubted by Cullen, the dose is from one to four drachms. It formed an ingredient in the celebrated remedy of Mad Neufleur but being there in combination with some of the most drastic purgatives its efficacy is still a matter of doubt. The mechanical operation of the Solches Pinacis, as well as the chemical of the Puls. Stanni, are both of a reputation to merit trials, their mode of employment as Sopups: of the former the dose is from two drachms to an ounce, of the latter, one to three drachms. The use of these three latter medicines, is best promoted by a combination of the drastic purgatives. Orum Jacobenthina, whether alone or in combination with Orum Ricini has always been a favourite prescription as a Moderate as highly stimulating and its use for the

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expulsion of Tape worm has met with an almost insurmountable success, in large doses of from one to four ounces, without any perceptible bad effects, a state closely allied to intoxication being induced, no fear of Stromylium need be founded against when given in such doses; its operator here being principally purgative; and not Stimulus as in smaller doses. Other medicines as the preparations of Asafoetida, Sulphur, the Sulphates of Zinc and Copper, have each been successfully employed, though from the occasional great length & great number of convulsions in Ionia, all these have proved insufficient for its discharge.

It is to be regretted that there exists no specific vermifuge capable of destroying without injuring the healthy structure of the stomach and Intestines. The treatment of worms and the various diseases connected with them does not

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always terminate with their more excretion
more than this becomes necessary. To make the
case complete, means must be taken to eradi-
cate the predisposing causes, and prevent their
further development. It has been already
remarked that Debility, and its concomitant
effects are the causes which favour this peculiar
position; to prevent which a liberal strenuous
and healthy regimen must be observed
together with the free employment of the
Mineral Tonics of which the Cast Iron
is to be preferred. Camphor is also highly
recommended by Boera as subservient to this
end, to give to the Stomach and intestines
their former natural and healthy vigour.

J. M. M.

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